

WHAT IS CLAIMED IS:

1. An antimicrobial peptide composition for use against organisms such as bacteria and fungi, comprising:

a peptide of from 7 to 74 amino acids containing a 7 amino acid core sequence: aa<sub>1</sub>-aa<sub>2</sub>-aa<sub>3</sub>-aa<sub>4</sub>-aa<sub>5</sub>-aa<sub>6</sub>-aa<sub>7</sub>, wherein aa<sub>1</sub> is the amino-terminus of the core sequence; one of aa<sub>6</sub> and aa<sub>7</sub> is selected from the group consisting of phenylalanine, tryptophan and tyrosine, such that when aa<sub>6</sub> is phenylalanine aa<sub>7</sub> is selected from the group consisting of lysine, arginine and histidine, when aa<sub>6</sub> is tryptophan aa<sub>7</sub> is lysine, and when aa<sub>7</sub> is phenylalanine aa<sub>6</sub> is leucine; and retromers, truncations, extensions, combinations, fusions, and derivatives thereof, said peptide having antimicrobial activity.

2. The antimicrobial peptide composition of Claim 1, wherein aa<sub>1</sub> is selected from the group consisting of alanine, lysine and glycine; aa<sub>2</sub> is selected from the group consisting of leucine and arginine; aa<sub>3</sub> is tyrosine; and aa<sub>4</sub> and aa<sub>5</sub> are selected from the group consisting of lysine, arginine, and histidine.

3. The antimicrobial peptide composition of Claim 1, wherein aa<sub>4</sub> and aa<sub>5</sub> are selected from the group consisting of lysine and arginine.

4. An antimicrobial peptide composition for use against organisms such as bacteria and fungi, comprising:

a peptide of from 7 to 74 amino acids containing a 7 amino acid core sequence: aa<sub>1</sub>-aa<sub>2</sub>-aa<sub>3</sub>-aa<sub>4</sub>-aa<sub>5</sub>-aa<sub>6</sub>-aa<sub>7</sub>, wherein aa<sub>1</sub> is the amino-terminus of the peptide; aa<sub>6</sub> is selected from the group consisting of phenylalanine and tryptophan and tyrosine; and aa<sub>7</sub> is selected from the group consisting of lysine and arginine; and retromers, truncations, extensions, combinations, fusions, and derivatives thereof, said peptide having antimicrobial activity.

5. The antimicrobial peptide composition of Claim 4, wherein when aa<sub>6</sub> is selected from the group consisting of phenylalanine and tryptophan, and aa<sub>7</sub> is selected from the group consisting of lysine and arginine.

6. The antimicrobial peptide composition of Claim 5, wherein aa<sub>1</sub> is selected from the group consisting of alanine, lysine and glycine; aa<sub>2</sub> is selected from the group consisting of leucine and arginine; aa<sub>3</sub> is tyrosine; and aa<sub>4</sub> and aa<sub>5</sub> are selected from the group consisting of lysine, arginine, glutamine, proline, histidine and asparagine.

7. The antimicrobial peptide composition of Claim 6, wherein aa<sub>4</sub> and aa<sub>5</sub> are selected from the group consisting of lysine and arginine.

8. An antimicrobial peptide composition for use against organisms such as bacteria and fungi, comprising:

a peptide of from 13 to 18 amino acids containing a 12 amino acid core sequence: aa<sub>1</sub>-aa<sub>2</sub>-aa<sub>3</sub>-aa<sub>4</sub>-aa<sub>5</sub>-aa<sub>6</sub>-aa<sub>7</sub>-aa<sub>8</sub>-aa<sub>9</sub>-aa<sub>10</sub>-aa<sub>11</sub>-aa<sub>12</sub>, wherein aa<sub>1</sub> is the amino-terminus of the peptide and is selected from the group consisting of leucine, isoleucine, alanine, valine, serine, lysine and glycine; aa<sub>2</sub> is selected from the group consisting of leucine, isoleucine, alanine, valine, serine and arginine; aa<sub>3</sub> is selected from the group consisting of phenylalanine, tryptophan and tyrosine; aa<sub>4</sub> and aa<sub>5</sub> are selected from the group consisting of lysine, arginine and histidine; one of aa<sub>6</sub> and aa<sub>7</sub> is selected from the group consisting of phenylalanine, tryptophan and tyrosine, such that when aa<sub>6</sub> is phenylalanine aa<sub>7</sub> is selected from the group consisting of lysine, arginine and histidine, when aa<sub>6</sub> is tryptophan aa<sub>7</sub> is lysine, and when aa<sub>7</sub> is phenylalanine aa<sub>6</sub> is leucine; aa<sub>8</sub> is selected from the group consisting of lysine, arginine, histidine and asparagine; aa<sub>9</sub> is selected from the group consisting of lysine, arginine and histidine; aa<sub>10</sub> is selected from the group consisting of leucine, isoleucine, alanine, valine and serine; aa<sub>11</sub> is selected from the group consisting of leucine, isoleucine, alanine, valine, serine and lysine; and aa<sub>12</sub> is selected from the group consisting of lysine, arginine and histidine; and retromers,

truncations, extensions, combinations, fusions, and derivatives thereof, said peptide having antimicrobial activity.

9. The antimicrobial peptide composition of Claim 8, wherein aa<sub>1</sub> is selected from the group consisting of alanine, lysine and glycine; aa<sub>2</sub> is selected from the group consisting of leucine and arginine; aa<sub>3</sub> is tyrosine; aa<sub>4</sub> and aa<sub>5</sub> are selected from the group consisting of lysine and arginine; aa<sub>8</sub> is selected from the group consisting of lysine and asparagine; aa<sub>9</sub> is lysine; aa<sub>10</sub> is selected from the group consisting of leucine and isoleucine; aa<sub>11</sub> is selected from the group consisting of leucine and lysine; and aa<sub>12</sub> is selected from the group consisting of lysine and arginine.

10. The antimicrobial peptide composition of Claim 8, wherein one of aa<sub>6</sub> and aa<sub>7</sub> is selected from the group consisting of phenylalanine and tryptophan, such that when aa<sub>6</sub> is phenylalanine aa<sub>7</sub> is selected from the group consisting of lysine and arginine, when aa<sub>6</sub> is tryptophan aa<sub>7</sub> is lysine, and when aa<sub>7</sub> is phenylalanine aa<sub>6</sub> is leucine.

11. The antimicrobial peptide composition of Claim 8, wherein aa<sub>1</sub> is selected from the group consisting of alanine, lysine and glycine; aa<sub>2</sub> is selected from the group consisting of leucine and arginine; aa<sub>3</sub> is tyrosine; aa<sub>6</sub> is selected from the group consisting of phenylalanine, tryptophan and tyrosine; aa<sub>7</sub> is selected from the group consisting of lysine and arginine; aa<sub>8</sub> is selected from the group consisting of lysine and asparagine; aa<sub>9</sub> is lysine; aa<sub>10</sub> is selected from the group consisting of leucine and isoleucine; aa<sub>11</sub> is selected from the group consisting of leucine and lysine; and aa<sub>12</sub> is selected from the group consisting of lysine and arginine.

12. The antimicrobial peptide composition of Claim 11, wherein when aa<sub>6</sub> is phenylalanine aa<sub>7</sub> is lysine or arginine, and when aa<sub>6</sub> is tryptophan aa<sub>7</sub> is lysine.

13. The antimicrobial peptide composition of Claim 8, wherein aa<sub>6</sub> is selected from the group consisting of phenylalanine, tryptophan and tyrosine; and aa<sub>7</sub> is selected from the group consisting of lysine and arginine.

14. The antimicrobial peptide composition of Claim 13, wherein when aa<sub>6</sub> is phenylalanine aa<sub>7</sub> is selected from the group consisting of lysine and arginine, and when aa<sub>6</sub> is tryptophan aa<sub>7</sub> is lysine.

15. An antimicrobial peptide composition for use against organisms such as bacteria and fungi, comprising:

a peptide of from 13 to 18 amino acids containing a 13 amino acid core sequence: aa<sub>1</sub>-aa<sub>2</sub>-aa<sub>3</sub>-aa<sub>4</sub>-aa<sub>5</sub>-aa<sub>6</sub>-aa<sub>7</sub>-aa<sub>8</sub>-aa<sub>9</sub>-aa<sub>10</sub>-aa<sub>11</sub>-aa<sub>12</sub>-aa<sub>13</sub>, wherein aa<sub>1</sub> is the amino-terminus of the peptide and is selected from the group consisting of leucine, isoleucine, alanine, valine, serine, lysine and glycine; aa<sub>2</sub> is selected from the group consisting of leucine, isoleucine, alanine, valine, serine and arginine; aa<sub>3</sub> is selected from the group consisting of phenylalanine, tryptophan, tyrosine; aa<sub>4</sub> and aa<sub>5</sub> are selected from the group consisting of lysine, arginine and histidine; one of aa<sub>6</sub> and aa<sub>7</sub> is selected from the group consisting of phenylalanine, tryptophan, tyrosine, and the other of aa<sub>6</sub> and aa<sub>7</sub> is selected from the group consisting of lysine, arginine and leucine, wherein when aa<sub>6</sub> is phenylalanine aa<sub>7</sub> is selected from the group consisting of lysine and arginine, when aa<sub>6</sub> is tryptophan aa<sub>7</sub> is lysine, and when aa<sub>7</sub> is phenylalanine aa<sub>6</sub> is leucine; aa<sub>8</sub> is selected from the group consisting of lysine, arginine, histidine and asparagine; aa<sub>9</sub> is selected from the group consisting of lysine, arginine and histidine; aa<sub>10</sub> is selected from the group consisting of leucine, isoleucine, alanine, valine and serine; aa<sub>11</sub> is selected from the group consisting of leucine, isoleucine, alanine, valine, serine and lysine; and aa<sub>12</sub> is selected from the group consisting of lysine, arginine and histidine; and aa<sub>13</sub> is selected from the group consisting of leucine, isoleucine, alanine, valine, serine, arginine and phenylalanine; and retromers, truncations, extensions, combinations, fusions, and D-isomeric amino acid, retromeric, N-

monomethyl-lysine, and fluorinated amino acid derivatives thereof, said peptide having antimicrobial activity.

16. The antimicrobial peptide composition of Claim 15, wherein aa<sub>1</sub> is selected from the group consisting of alanine, lysine and glycine; aa<sub>2</sub> is selected from the group consisting of leucine and arginine; aa<sub>3</sub> is tyrosine; aa<sub>4</sub> and aa<sub>5</sub> are selected from the group consisting of lysine, arginine and histidine; aa<sub>8</sub> is selected from the group consisting of lysine and asparagine; aa<sub>9</sub> is lysine; aa<sub>10</sub> is selected from the group consisting of leucine and isoleucine; aa<sub>11</sub> is selected from the group consisting of leucine and lysine; and aa<sub>12</sub> is selected from the group consisting of lysine and arginine.

17. The antimicrobial peptide composition of Claim 16, wherein aa<sub>13</sub> is selected from the group consisting of serine, leucine, arginine and phenylalanine.

18. An antimicrobial peptide composition for direct activity or for potentiating antimicrobial agents active against organisms such as bacteria and fungi, comprising:

a peptide of from 13 to 74 containing an amino acid core sequence selected from the group consisting of truncations of PMP-1 (Sequence No. 2), and retromers, extensions, combinations and fusions thereof; truncations of PMP-2 (Sequence No. 1), and retromers, extensions, combinations and fusions thereof.

19. The antimicrobial peptide composition of Claim 18, further comprising a pharmaceutically acceptable carrier.

20. The antimicrobial peptide composition of Claim 18, wherein said peptide is a truncation of PMP-2 (Sequence No. 1) and comprises residues 28 to 74 of PMP-2 (Sequence No. 1).

21. The antimicrobial peptide composition of Claim 18, wherein said peptide is a truncation of PMP-2 (Sequence No. 1) and comprises residues 43 to 74 of PMP-2 (Sequence No. 1).

22. The antimicrobial peptide composition of Claim 18, wherein said peptide is a truncation of PMP-2 (Sequence No. 1) and comprises residues 59 to 74 of PMP-2 (Sequence No. 1).

23. The antimicrobial peptide composition of Claim 18, wherein said peptide is a truncation of PMP-2 (Sequence No. 1) and comprises residues 45 to 74 of PMP-2 (Sequence No. 1).

24. The antimicrobial peptide composition of Claim 18, wherein said peptide comprises an extension of RP-1 (Sequence No. 3) by RP-1 residues 1-10.

25. The antimicrobial peptide composition of Claim 18, wherein said peptide comprises a combination of RP-1 (Sequence No. 3) with RP-13 (Sequence No. 14).

26. An antimicrobial peptide composition for use against organisms such as bacteria and fungi, comprising:

a peptide of from 8 to 20 amino acids containing an amino acid core sequence of a first amino acid sequence domain, a second amino acid sequence domain, and a third amino acid sequence domain, where said first amino acid sequence domain is a sequence of from one to six amino acids selected from the group consisting of leucine, isoleucine, alanine, valine, serine, glycine, and threonine; said second amino acid sequence domain is a sequence of from one to two amino acids selected from the group consisting of lysine, arginine, histidine, glutamine, proline, glutamic acid, aspartic acid and glycine; said third amino acid sequence domain is a sequence of from one to nine amino acids selected from the group consisting of leucine, isoleucine, alanine, valine, serine, glycine, and

threonine; and where the amino acids within said first, second and third amino acid sequence domains may be separated, and said first, second and third amino acid domains may be separated from each other by up to three amino acids selected from the group consisting of asparagine, cystine, aspartic acid, glutamic acid and methionine; and retromers, truncations, extensions, combinations, fusions, and derivatives thereof, said peptide having antimicrobial activity.

27. The antimicrobial peptide composition of Claim 26, wherein said peptide contains an amino acid core sequence aa<sub>1</sub>-aa<sub>2</sub>-aa<sub>3</sub>-aa<sub>4</sub>-aa<sub>5</sub>-aa<sub>6</sub>-aa<sub>7</sub>-aa<sub>8</sub>-aa<sub>9</sub>-aa<sub>10</sub>-aa<sub>11</sub>-aa<sub>12</sub>-aa<sub>13</sub>-aa<sub>14</sub>-aa<sub>15</sub>-aa<sub>16</sub>-aa<sub>17</sub>, wherein aa<sub>1</sub> is the amino-terminus of the peptide and is selected from the group consisting of leucine, isoleucine, alanine, valine, serine, glycine, and threonine; aa<sub>2</sub> is selected from the group consisting of leucine, isoleucine, alanine, valine, serine, glycine, and threonine; aa<sub>3</sub> and aa<sub>4</sub> are selected from the group consisting of lysine, arginine, histidine, glutamine, and proline; aa<sub>5</sub> is selected from the group consisting of asparagine, cystine, aspartic acid, glutamic acid and methionine; aa<sub>6</sub> is selected from the group consisting of leucine, isoleucine, alanine, valine, serine, glycine, and threonine; aa<sub>7</sub> is selected from the group consisting of lysine, arginine, histidine, glutamine, proline, glutamic acid, aspartic acid and glycine; aa<sub>8</sub> is selected from the group consisting of lysine, arginine, histidine, glutamine, proline and glutamic acid; aa<sub>9</sub>, aa<sub>11</sub>, aa<sub>13</sub>, aa<sub>15</sub>, aa<sub>16</sub>, and aa<sub>17</sub> are selected from the group consisting of leucine, isoleucine, alanine, valine, serine, glycine, and threonine; aa<sub>10</sub> and aa<sub>12</sub> are selected from the group consisting of asparagine, cystine, aspartic acid, glutamic acid and methionine; and aa<sub>14</sub> is selected from the group consisting of lysine, arginine, histidine, glutamine and proline.

28. The antimicrobial peptide composition of Claim 26, wherein said peptide contains an amino acid core sequence aa<sub>1</sub>-aa<sub>2</sub>-aa<sub>3</sub>-aa<sub>4</sub>-aa<sub>5</sub>-aa<sub>6</sub>-aa<sub>7</sub>-aa<sub>8</sub>-aa<sub>9</sub>-aa<sub>10</sub>-aa<sub>11</sub>-aa<sub>12</sub>-aa<sub>13</sub>-aa<sub>14</sub>-aa<sub>15</sub>-aa<sub>16</sub>-aa<sub>17</sub>, wherein aa<sub>1</sub> is the amino-terminus of the peptide core sequence and is alanine; aa<sub>2</sub> is threonine; aa<sub>3</sub> and aa<sub>4</sub> are lysine; aa<sub>5</sub> is asparagine; aa<sub>6</sub> is

glycine; aa<sub>7</sub> is arginine; aa<sub>8</sub> is lysine; aa<sub>9</sub>, aa<sub>11</sub>, aa<sub>13</sub> and aa<sub>17</sub> are leucine; aa<sub>10</sub> is cystine; aa<sub>12</sub> is aspartic acid; aa<sub>14</sub> is glutamine; and aa<sub>15</sub> and aa<sub>16</sub> are alanine.

29. The antimicrobial peptide composition of Claim 26, wherein said peptide contains an amino acid core sequence aa<sub>1</sub>-aa<sub>2</sub>-aa<sub>3</sub>-aa<sub>4</sub>-aa<sub>5</sub>-aa<sub>6</sub>-aa<sub>7</sub>-aa<sub>8</sub>, wherein aa<sub>1</sub> is the amino-terminus of the peptide core sequence and is arginine; aa<sub>2</sub> is phenylalanine; aa<sub>3</sub> is glutamic acid; aa<sub>4</sub> is lysine; aa<sub>5</sub> is serine; aa<sub>6</sub> is lysine; aa<sub>7</sub> is isoleucine; and aa<sub>8</sub> is lysine.

30. The antimicrobial peptide composition of Claim 26, wherein said peptide contains an amino acid core sequence aa<sub>1</sub>-aa<sub>2</sub>-aa<sub>3</sub>-aa<sub>4</sub>-aa<sub>5</sub>-aa<sub>6</sub>-aa<sub>7</sub>-aa<sub>8</sub>-aa<sub>9</sub>-aa<sub>10</sub>-aa<sub>11</sub>-aa<sub>12</sub>-aa<sub>13</sub>-aa<sub>14</sub>-aa<sub>15</sub>-aa<sub>16</sub>-aa<sub>17</sub>-aa<sub>18</sub>-aa<sub>19</sub>-aa<sub>20</sub>, wherein aa<sub>1</sub> is the amino-terminus of the peptide and is serine; aa<sub>2</sub> is alanine; aa<sub>3</sub> is isoleucine; aa<sub>4</sub> is histidine; aa<sub>5</sub> is proline; aa<sub>6</sub> and aa<sub>7</sub> are serine; aa<sub>8</sub> is isoleucine; aa<sub>9</sub> is leucine; aa<sub>10</sub> is lysine; aa<sub>11</sub> is leucine; aa<sub>12</sub> is glutamic acid; aa<sub>13</sub> is valine; aa<sub>14</sub> is isoleucine; aa<sub>15</sub> is cystine; aa<sub>16</sub> is isoleucine; aa<sub>17</sub> is glycine; aa<sub>18</sub> is valine; aa<sub>19</sub> is leucine; and aa<sub>20</sub> is glutamine.

31. The antimicrobial peptide composition of Claim 26, wherein said peptide contains an amino acid core sequence aa<sub>1</sub>-aa<sub>2</sub>-aa<sub>3</sub>-aa<sub>4</sub>-aa<sub>5</sub>-aa<sub>6</sub>-aa<sub>7</sub>-aa<sub>8</sub>-aa<sub>9</sub>-aa<sub>10</sub>-aa<sub>11</sub>-aa<sub>12</sub>-aa<sub>13</sub>-aa<sub>14</sub>, wherein aa<sub>1</sub> is the amino-terminus of the peptide and is tyrosine; aa<sub>2</sub> is alanine; aa<sub>3</sub> is selected from the group consisting of aspartic acid and glutamic acid; aa<sub>4</sub> and aa<sub>5</sub> are selected from the group consisting of leucine, arginine and histidine; aa<sub>6</sub> is cystine; aa<sub>7</sub> is selected from the group consisting of threonine or valine; aa<sub>8</sub> is cystine; aa<sub>9</sub> is serine; aa<sub>10</sub> is isoleucine; aa<sub>11</sub> is lysine; aa<sub>12</sub> is alanine; aa<sub>13</sub> is glutamic acid; and aa<sub>14</sub> is valine.



32. An antimicrobial peptide composition for use against organisms such as bacteria and fungi, comprising:

a peptide of from 5 to 150 amino acids containing an amino acid core sequence of a first amino acid sequence domain, a second amino acid sequence domain, a third amino acid sequence domain, and a fourth amino acid sequence domain, and wherein said first amino acid sequence domain is at the amino-terminus of the amino acid core sequence and is a sequence of from one to five amino acids selected from the group consisting of phenylalanine, tryptophan, tyrosine, where amino acids of said first amino acid sequence domain may be separated from each other by an amino acid selected from the group consisting of leucine, isoleucine, alanine, valine and serine; said second amino acid sequence domain is an amino acid selected from the group consisting of lysine, arginine, histidine, glutamine, and proline; said third amino acid sequence domain is a sequence of from one to five amino acids selected from the group consisting of phenylalanine, tryptophan, tyrosine; and said fourth amino acid sequence domain is an amino acid selected from the group consisting of lysine, arginine, histidine, glutamine, and proline; and retromers, truncations, extensions, combinations, fusions, and derivatives thereof, said peptide having antimicrobial activity.

33. The antimicrobial peptide composition of Claim 32, wherein said peptide contains the amino acid sequence aa<sub>1</sub>-aa<sub>2</sub>-aa<sub>3</sub>-aa<sub>4</sub>-aa<sub>5</sub>-aa<sub>6</sub>-aa<sub>7</sub>-aa<sub>8</sub>-aa<sub>9</sub>-aa<sub>10</sub>-aa<sub>11</sub>, wherein aa<sub>1</sub> is the amino-terminus of the peptide and is lysine; aa<sub>2</sub> is phenylalanine; aa<sub>3</sub> is lysine; aa<sub>4</sub> is histidine; aa<sub>5</sub> is tyrosine; aa<sub>6</sub> and aa<sub>7</sub> are phenylalanine; aa<sub>8</sub> is tryptophan; aa<sub>9</sub> is lysine; aa<sub>10</sub> is tyrosine; and aa<sub>11</sub> is lysine.

34. The antimicrobial peptide composition of Claim 32, wherein said peptide contains the amino acid sequence aa<sub>1</sub>-aa<sub>2</sub>-aa<sub>3</sub>-aa<sub>4</sub>-aa<sub>5</sub>-aa<sub>6</sub>-aa<sub>7</sub>-aa<sub>8</sub>-aa<sub>9</sub>-aa<sub>10</sub>-aa<sub>11</sub>, wherein aa<sub>1</sub> is the amino-terminus of the peptide and is lysine; aa<sub>2</sub> is glycine; aa<sub>3</sub> is tyrosine; aa<sub>4</sub> is phenylalanine; aa<sub>5</sub> is tyrosine; aa<sub>6</sub> is phenylalanine; aa<sub>7</sub> is leucine; aa<sub>8</sub> is phenylalanine; aa<sub>9</sub> is lysine; aa<sub>10</sub> is phenylalanine; and aa<sub>11</sub> is lysine.

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35. The antimicrobial peptide composition of Claim 32, wherein said peptide contains the amino acid sequence aa<sub>1</sub>-aa<sub>2</sub>-aa<sub>3</sub>-aa<sub>4</sub>-aa<sub>5</sub>-aa<sub>6</sub>-aa<sub>7</sub>-aa<sub>8</sub>-aa<sub>9</sub>-aa<sub>10</sub>-aa<sub>11</sub>, wherein aa<sub>1</sub> is the amino-terminus of the peptide and is lysine; aa<sub>2</sub> is tryptophan; aa<sub>3</sub> is lysine; aa<sub>4</sub>, aa<sub>5</sub>, aa<sub>6</sub>, aa<sub>7</sub> and aa<sub>8</sub> are tryptophan; aa<sub>9</sub> is lysine; aa<sub>10</sub> is tryptophan; and aa<sub>11</sub> is lysine.

36. An antimicrobial peptide composition for use against organisms such as bacteria and fungi, comprising:

a peptide of from 11 to 20 amino acids containing from one to four units of an amino acid core sequence domain, wherein adjacent units of said amino acid core sequence domain may be separated from each other by from one to two amino acids selected from the group consisting of phenylalanine, tryptophan, tyrosine, asparagine, cystine, aspartic acid, glutamic acid and methionine; wherein said amino acid sequence domain consists of a first group of amino acids and a second group of amino acids, said first group of amino acids consisting of from one to six amino acids selected from the group of leucine, isoleucine, alanine, valine, serine, glycine, and threonine, and said second group of amino acids consisting of from one to three amino acids selected from the group of lysine, arginine, histidine, glutamine, and proline; wherein said the amino acids in said first and second groups of amino acids may be separated by from one to two amino acids selected from the group consisting of phenylalanine, tryptophan, tyrosine, asparagine, cystine, aspartic acid, glutamic acid and methionine; and wherein said first and second groups of amino acids may be separated from each other by an amino acid selected from the group consisting of phenylalanine, tryptophan and tyrosine; and retromers, truncations, extensions, combinations, fusions, and derivatives thereof, said peptide having antimicrobial activity.

37. The antimicrobial peptide composition of Claim 36, wherein said peptide contains two of said units of said amino acid core sequence domain.

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38. The antimicrobial peptide composition of Claim 37, wherein said two units of said amino acid core sequence domain are separated by an amino acid selected from the group consisting of asparagine, cystine, aspartic acid, glutamic acid and methionine, and an amino acid selected from the group consisting of phenylalanine, tryptophan and tyrosine.

39. The antimicrobial peptide composition of Claim 37, wherein said two units of said amino acid core sequence domain are separated by an amino acid selected from the group consisting of phenylalanine, tryptophan and tyrosine.

40. The antimicrobial peptide composition of Claim 36, wherein said peptide contains three of said units of said amino acid core sequence domain.

41. The antimicrobial peptide composition of Claim 37, wherein the first and second units of said amino acid core sequence domain are separated by an amino acid selected from the group consisting of phenylalanine, tryptophan and tyrosine.

42. The antimicrobial peptide composition of Claim 36, wherein said peptide contains four of said units of said amino acid core sequence domain.

43. The antimicrobial peptide composition of Claim 42, wherein the first and second units of said amino acid core sequence domain are separated by an amino acid selected from the group consisting of phenylalanine, tryptophan and tyrosine.

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44. The antimicrobial peptide composition of Claim 36, wherein said peptide contains the amino acid sequence aa<sub>1</sub>-aa<sub>2</sub>-aa<sub>3</sub>-aa<sub>4</sub>-aa<sub>5</sub>-aa<sub>6</sub>-aa<sub>7</sub>-aa<sub>8</sub>-aa<sub>9</sub>-aa<sub>10</sub>-aa<sub>11</sub>-aa<sub>12</sub>-aa<sub>13</sub>, wherein aa<sub>1</sub> is the amino-terminus of the peptide and is proline, aa<sub>2</sub> is arginine, aa<sub>3</sub> is isoleucine, aa<sub>4</sub> and aa<sub>5</sub> are lysine, aa<sub>6</sub> is isoleucine, aa<sub>7</sub> is valine, aa<sub>8</sub> is glutamine, aa<sub>9</sub> and aa<sub>10</sub> are lysine, aa<sub>11</sub> is leucine, aa<sub>12</sub> is alanine, and aa<sub>13</sub> is glycine.

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45. The antimicrobial peptide composition of Claim 36, wherein said peptide contains the amino acid sequence aa<sub>1</sub>-aa<sub>2</sub>-aa<sub>3</sub>-aa<sub>4</sub>-aa<sub>5</sub>-aa<sub>6</sub>-aa<sub>7</sub>-aa<sub>8</sub>-aa<sub>9</sub>-aa<sub>10</sub>-aa<sub>11</sub>-aa<sub>12</sub>-aa<sub>13</sub>-aa<sub>14</sub>-aa<sub>15</sub>-aa<sub>16</sub>-aa<sub>17</sub>-aa<sub>18</sub>-aa<sub>19</sub>, wherein aa<sub>1</sub> is the amino-terminus of the peptide and is lysine, aa<sub>2</sub> is tryptophan, aa<sub>3</sub> is valine, aa<sub>4</sub> is arginine, aa<sub>5</sub> is glutamic acid, aa<sub>6</sub> is tryosine, aa<sub>7</sub> is isoleucine, aa<sub>8</sub> is asparagine, aa<sub>9</sub> is serine, aa<sub>10</sub> is leucine, aa<sub>11</sub> is glutamic acid, aa<sub>12</sub> is methionine, aa<sub>13</sub> is serine, aa<sub>14</sub> and aa<sub>15</sub> are lysine, aa<sub>16</sub> is glycine, aa<sub>17</sub> is leucine, aa<sub>18</sub> is alanine, and aa<sub>19</sub> is glycine.

46. The antimicrobial peptide composition of Claim 36, wherein said peptide contains the amino acid sequence aa<sub>1</sub>-aa<sub>2</sub>-aa<sub>3</sub>-aa<sub>4</sub>-aa<sub>5</sub>-aa<sub>6</sub>-aa<sub>7</sub>-aa<sub>8</sub>-aa<sub>9</sub>-aa<sub>10</sub>-aa<sub>11</sub>-aa<sub>12</sub>-aa<sub>13</sub>-aa<sub>14</sub>-aa<sub>15</sub>-aa<sub>16</sub>-aa<sub>17</sub>-aa<sub>18</sub>-aa<sub>19</sub>-aa<sub>20</sub>, wherein aa<sub>1</sub> is the amino-terminus of the peptide and is glutamic acid, aa<sub>2</sub> is tryptophan, aa<sub>3</sub> is valine, aa<sub>4</sub> is glutamine, aa<sub>5</sub> is lysine, aa<sub>6</sub> is tryosine, aa<sub>7</sub> is valine, aa<sub>8</sub> is serine, aa<sub>9</sub> is asparagine, aa<sub>10</sub> is leucine, aa<sub>11</sub> is glutamic acid, aa<sub>12</sub> is leucine, aa<sub>13</sub> is serine, aa<sub>14</sub> is alanine, aa<sub>15</sub> is tryptophan, aa<sub>16</sub> and aa<sub>17</sub> are lysine, aa<sub>18</sub> is isoleucine, aa<sub>19</sub> is leucine, and aa<sub>20</sub> is lysine.

47. The antimicrobial peptide composition of Claim 36, wherein said peptide contains the amino acid sequence aa<sub>1</sub>-aa<sub>2</sub>-aa<sub>3</sub>-aa<sub>4</sub>-aa<sub>5</sub>-aa<sub>6</sub>-aa<sub>7</sub>-aa<sub>8</sub>-aa<sub>9</sub>-aa<sub>10</sub>-aa<sub>11</sub>-aa<sub>12</sub>, wherein aa<sub>1</sub> is the amino-terminus of the peptide and is serine, aa<sub>2</sub> is tryptophan, aa<sub>3</sub> is valine, aa<sub>4</sub> is glutamine, aa<sub>5</sub> is glutamic acid, aa<sub>6</sub> is tryosine, aa<sub>7</sub> is valine, aa<sub>8</sub> is tryosine, aa<sub>9</sub> is asparagine, aa<sub>10</sub> is leucine, aa<sub>11</sub> is glutamic acid, and aa<sub>12</sub> is leucine.

48. The antimicrobial peptide composition of Claim 36, wherein said peptide contains the amino acid sequence aa<sub>1</sub>-aa<sub>2</sub>-aa<sub>3</sub>-aa<sub>4</sub>-aa<sub>5</sub>-aa<sub>6</sub>-aa<sub>7</sub>-aa<sub>8</sub>-aa<sub>9</sub>-aa<sub>10</sub>-aa<sub>11</sub>-aa<sub>12</sub>-aa<sub>13</sub>-aa<sub>14</sub>-aa<sub>15</sub>-aa<sub>16</sub>, wherein aa<sub>1</sub> is the amino-terminus of the peptide and is alanine, aa<sub>2</sub> is asparagine, aa<sub>3</sub> is serine, aa<sub>4</sub> is glycine, aa<sub>5</sub> is glutamic acid, aa<sub>6</sub> is glycine, aa<sub>7</sub> is asparagine, aa<sub>8</sub> is phenylalanine, aa<sub>9</sub> is leucine, aa<sub>10</sub> is alanine, aa<sub>11</sub> is glutamic acid, aa<sub>12</sub>, aa<sub>13</sub> and aa<sub>14</sub> are glycine, aa<sub>15</sub> is valine, and aa<sub>16</sub> is arginine.

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49. The antimicrobial peptide composition of Claim 36, wherein said peptide contains the amino acid sequence aa<sub>1</sub>-aa<sub>2</sub>-aa<sub>3</sub>-aa<sub>4</sub>-aa<sub>5</sub>-aa<sub>6</sub>-aa<sub>7</sub>-aa<sub>8</sub>-aa<sub>9</sub>-aa<sub>10</sub>-aa<sub>11</sub>-aa<sub>12</sub>-aa<sub>13</sub>-aa<sub>14</sub>-aa<sub>15</sub>-aa<sub>16</sub>-aa<sub>17</sub>-aa<sub>18</sub>-aa<sub>19</sub>-aa<sub>20</sub>, wherein aa<sub>1</sub> is the amino-terminus of the peptide and is alanine, aa<sub>2</sub> is asparagine, aa<sub>3</sub> is serine, aa<sub>4</sub> is glycine, aa<sub>5</sub> is glutamic acid, aa<sub>6</sub> is glycine, aa<sub>7</sub> is asparagine, aa<sub>8</sub> is phenylalanine, aa<sub>9</sub> is leucine, aa<sub>10</sub> is alanine, aa<sub>11</sub> is glutamic acid, aa<sub>12</sub>, aa<sub>13</sub> and aa<sub>14</sub> are glycine, aa<sub>15</sub> is valine, aa<sub>16</sub> is arginine, aa<sub>17</sub> is lysine, aa<sub>18</sub> is leucine, aa<sub>19</sub> is isoleucine, and aa<sub>20</sub> is lysine.

50. The antimicrobial peptide composition of Claim 36, wherein said peptide contains the amino acid sequence aa<sub>1</sub>-aa<sub>2</sub>-aa<sub>3</sub>-aa<sub>4</sub>-aa<sub>5</sub>-aa<sub>6</sub>-aa<sub>7</sub>-aa<sub>8</sub>-aa<sub>9</sub>-aa<sub>10</sub>-aa<sub>11</sub>-aa<sub>12</sub>-aa<sub>13</sub>, wherein aa<sub>1</sub> is the amino-terminus of the peptide and is glutamic acid, aa<sub>2</sub> is glycine, aa<sub>3</sub> is valine, aa<sub>4</sub> is asparagine, aa<sub>5</sub> is aspartic acid, aa<sub>6</sub> is asparagine, aa<sub>7</sub> and aa<sub>8</sub> are glutamic acid, aa<sub>9</sub> is glycine, aa<sub>10</sub> and aa<sub>11</sub> are phenylalanine, aa<sub>12</sub> is serine, and aa<sub>13</sub> is alanine.

51. The antimicrobial peptide composition of Claim 36, wherein said peptide contains the amino acid sequence aa<sub>1</sub>-aa<sub>2</sub>-aa<sub>3</sub>-aa<sub>4</sub>-aa<sub>5</sub>-aa<sub>6</sub>-aa<sub>7</sub>-aa<sub>8</sub>-aa<sub>9</sub>-aa<sub>10</sub>-aa<sub>11</sub>-aa<sub>12</sub>-aa<sub>13</sub>-aa<sub>14</sub>-aa<sub>15</sub>-aa<sub>16</sub>-aa<sub>17</sub>-aa<sub>18</sub>, wherein aa<sub>1</sub> is the amino-terminus of the peptide and is lysine, aa<sub>2</sub> is phenylalanine, aa<sub>3</sub> is asparagine, aa<sub>4</sub> is lysine, aa<sub>5</sub> is serine, aa<sub>6</sub> is lysine, aa<sub>7</sub> is leucine, aa<sub>8</sub> and aa<sub>9</sub> are lysine, aa<sub>10</sub> is threonine, aa<sub>11</sub> is glutamic acid, aa<sub>12</sub> is threonine, aa<sub>13</sub> is glutamine, aa<sub>14</sub> is glutamic acid, aa<sub>15</sub> is lysine, aa<sub>16</sub> is asparagine, aa<sub>17</sub> is proline, and aa<sub>18</sub> is leucine.

52. The antimicrobial peptide composition of Claim 36, wherein said peptide contains the amino acid sequence aa<sub>1</sub>-aa<sub>2</sub>-aa<sub>3</sub>-aa<sub>4</sub>-aa<sub>5</sub>-aa<sub>6</sub>-aa<sub>7</sub>-aa<sub>8</sub>-aa<sub>9</sub>-aa<sub>10</sub>-aa<sub>11</sub>-aa<sub>12</sub>-aa<sub>13</sub>-aa<sub>14</sub>-aa<sub>15</sub>, wherein aa<sub>1</sub> is the amino-terminus of the peptide and is alanine, aa<sub>2</sub> is asparagine, aa<sub>3</sub> is leucine, aa<sub>4</sub> is isoleucine, aa<sub>5</sub> is alanine, aa<sub>6</sub> is threonine, aa<sub>7</sub> and aa<sub>8</sub> are lysine, aa<sub>9</sub> is asparagine, aa<sub>10</sub> is glycine, aa<sub>11</sub> is arginine, aa<sub>12</sub> is lysine, aa<sub>13</sub> is leucine, aa<sub>14</sub> is cystine, and aa<sub>15</sub> is leucine.

53. An antimicrobial peptide for potentiating antimicrobial activity of leukocytes against organisms such as bacteria and fungi, and for activity against organisms such as bacteria and fungi , comprising:

a peptide of from 5 to 150 amino acids having a three amino acid core sequence of a first amino acid which is cystine, a second amino acid which is selected from the group consisting of leucine, isoleucine, alanine, valine, serine, glycine, threonine, phenylalanine, tryptophan, tyrosine, lysine, arginine, glutamine, proline, and histidine, and a third amino acid which is cystine.

54. An antimicrobial peptide for potentiating antimicrobial activity of leukocytes against organisms such as bacteria and fungi, and for activity against organisms such as bacteria and fungi , comprising:

a peptide of from 5 to 150 amino acids having an amino acid core sequence of a first amino acid sequence domain, a second amino acid sequence domain, and a third amino acid sequence domain, wherein said first amino acid sequence domain is a sequence of three amino acids selected from the group consisting of leucine, isoleucine, alanine, valine, serine, glycine, threonine, phenylalanine, tryptophan, tyrosine, lysine, arginine, glutamine, proline, and histidine; said second amino acid sequence is a first amino acid which is cystine, a second amino acid which is selected from the group consisting of leucine, isoleucine, alanine, valine, serine, glycine, threonine, phenylalanine, tryptophan, tyrosine, lysine, arginine, glutamine, proline, and histidine, and a third amino acid which is cystine; and said third amino acid sequence is a sequence of six amino acids selected from the group consisting of leucine, isoleucine, alanine, valine, serine, glycine, threonine, phenylalanine, tryptophan, tyrosine, lysine, arginine, glutamine, proline, and histidine.

55. An antimicrobial peptide for potentiating antimicrobial activity of leukocytes against organisms such as bacteria and fungi, and for activity against organisms such as bacteria and fungi, comprising:

a peptide of from 5 to 150 amino acids having an amino acid core sequence of a first amino acid sequence domain, a second amino acid sequence domain, a third amino acid sequence domain, and a fourth amino acid sequence domain, wherein said first amino acid sequence domain is a sequence of from 13 to 18 amino acids containing a 12 amino acid core sequence: aa<sub>1</sub>-aa<sub>2</sub>-aa<sub>3</sub>-aa<sub>4</sub>-aa<sub>5</sub>-aa<sub>6</sub>-aa<sub>7</sub>-aa<sub>8</sub>-aa<sub>9</sub>-aa<sub>10</sub>-aa<sub>11</sub>-aa<sub>12</sub>, wherein aa<sub>1</sub> is the amino-terminus of the peptide, one of aa<sub>6</sub> and aa<sub>7</sub> is selected from the group consisting of phenylalanine and tryptophan, such that when aa<sub>6</sub> is phenylalanine aa<sub>7</sub> is selected from the group consisting of lysine and arginine, when aa<sub>6</sub> is tryptophan aa<sub>7</sub> is lysine, and when aa<sub>7</sub> is phenylalanine aa<sub>6</sub> is leucine; said second amino acid sequence domain is a sequence of three amino acids selected from the group consisting of leucine, isoleucine, alanine, valine, serine, glycine, threonine, phenylalanine, tryptophan, tyrosine, lysine, arginine, glutamine, proline, and histidine; said third amino acid sequence domain is a first amino acid which is cystine, a second amino acid which is selected from the group consisting of leucine, isoleucine, alanine, valine, serine, glycine, threonine, phenylalanine, tryptophan, tyrosine, lysine, arginine, glutamine, proline, and histidine, and a third amino acid which is cystine; and said fourth amino acid sequence domain is a sequence of six amino acids selected from the group consisting of leucine, isoleucine, alanine, valine, serine, glycine, threonine, phenylalanine, tryptophan, tyrosine, lysine, arginine, glutamine, proline, and histidine.

56. An antimicrobial peptide for potentiating antimicrobial activity of leukocytes against organisms such as bacteria and fungi, and for activity against organisms such as bacteria and fungi, comprising:

a peptide of from 5 to 150 amino acids having an amino acid core sequence of a first amino acid sequence domain, a second amino acid sequence domain, a third amino acid sequence domain, and a fourth amino acid sequence domain, wherein said first

amino acid sequence domain is a sequence of three amino acids selected from the group consisting of leucine, isoleucine, alanine, valine, serine, glycine, threonine, phenylalanine, tryptophan, tyrosine, lysine, arginine, glutamine, proline, and histidine; said second amino acid sequence is a first amino acid which is cystine, a second amino acid which is selected from the group consisting of leucine, isoleucine, alanine, valine, serine, glycine, threonine, phenylalanine, tryptophan, tyrosine, lysine, arginine, glutamine, proline, and histidine, and a third amino acid which is cystine; said third amino acid sequence is a sequence of six amino acids selected from the group consisting of leucine, isoleucine, alanine, valine, serine, glycine, threonine, phenylalanine, tryptophan, tyrosine, lysine, arginine, glutamine, proline, and histidine; and said fourth amino acid sequence domain is a sequence of from 13 to 18 amino acids containing a 12 amino acid core sequence: aa<sub>1</sub>-aa<sub>2</sub>-aa<sub>3</sub>-aa<sub>4</sub>-aa<sub>5</sub>-aa<sub>6</sub>-aa<sub>7</sub>-aa<sub>8</sub>-aa<sub>9</sub>-aa<sub>10</sub>-aa<sub>11</sub>-aa<sub>12</sub>, wherein aa<sub>1</sub> is the amino-terminus of the peptide, one of aa<sub>6</sub> and aa<sub>7</sub> is selected from the group consisting of phenylalanine and tryptophan, such that when aa<sub>6</sub> is phenylalanine aa<sub>7</sub> is selected from the group consisting of lysine and arginine, when aa<sub>6</sub> is tryptophan aa<sub>7</sub> is lysine, and when aa<sub>7</sub> is phenylalanine aa<sub>6</sub> is leucine, and retromers, truncations, extensions, combinations, fusions, and derivatives thereof, said peptide having antimicrobial activity.

57. An antimicrobial peptide composition for use against organisms such as bacteria and fungi, comprising:

a peptide of from 11 to 22 amino acids containing an 10 amino acid core sequence: aa<sub>1</sub>-aa<sub>2</sub>-aa<sub>3</sub>-aa<sub>4</sub>-aa<sub>5</sub>-aa<sub>6</sub>-aa<sub>7</sub>-aa<sub>8</sub>-aa<sub>9</sub>-aa<sub>10</sub>, wherein aa<sub>1</sub> is the amino-terminus of the amino acid core sequence and is threonine; aa<sub>2</sub> and aa<sub>3</sub> are selected from the group consisting of lysine and arginine; aa<sub>4</sub> is asparagine; aa<sub>5</sub> is glycine; aa<sub>6</sub> is selected from the group consisting of lysine, arginine, glutamic acid and glycine; aa<sub>7</sub> is selected from the group consisting of lysine, arginine and glutamic acid; aa<sub>8</sub> is leucine; aa<sub>9</sub> is cystine; and aa<sub>10</sub> is leucine, and retromers, truncations, extensions, combinations, fusions, and derivatives thereof, said peptide having antimicrobial activity.



58. The antimicrobial peptide composition of Claim 57, wherein said amino acid core sequence further contains the amino acid sequence aa<sub>11</sub>-aa<sub>12</sub>-aa<sub>13</sub>-aa<sub>14</sub>-aa<sub>15</sub>-aa<sub>16</sub>, and wherein aa<sub>11</sub> is selected from the group consisting of aspartic acid, glutamic acid, lysine, and glycine; aa<sub>12</sub> is leucine; aa<sub>13</sub> is glutamine; aa<sub>14</sub> and aa<sub>15</sub> are alanine; and aa<sub>16</sub> is leucine.

59. The antimicrobial peptide composition of Claim 58, wherein said amino acid core sequence further contains the amino acid sequence aa<sub>17</sub>-aa<sub>18</sub>-aa<sub>19</sub>, and wherein aa<sub>17</sub> is selected from the group consisting of tyrosine, phenylalanine and tryptophan; and aa<sub>18</sub> and aa<sub>19</sub> are selected from the group consisting of lysine, arginine, and glutamic acid.

60. The antimicrobial peptide composition of Claim 59, wherein said amino acid core sequence further contains the amino acid aa<sub>20</sub> selected from the group consisting of lysine, arginine, and glutamic acid.

61. An antimicrobial peptide composition for use against organisms such as bacteria and fungi, comprising:

a peptide of from 19 to 22 amino acids containing an 11 amino acid core sequence: aa<sub>1</sub>-aa<sub>2</sub>-aa<sub>3</sub>-aa<sub>4</sub>-aa<sub>5</sub>-aa<sub>6</sub>-aa<sub>7</sub>-aa<sub>8</sub>-aa<sub>9</sub>-aa<sub>10</sub>-aa<sub>11</sub>, wherein aa<sub>1</sub> is the amino-terminus of the amino acid core sequence and is alanine; aa<sub>2</sub> is threonine; aa<sub>3</sub> and aa<sub>4</sub> are selected from the group consisting of lysine and arginine; aa<sub>5</sub> is asparagine; aa<sub>6</sub> is glycine; aa<sub>7</sub> is selected from the group consisting of lysine, arginine, glutamic acid and glycine; aa<sub>8</sub> is selected from the group consisting of lysine, arginine and glutamic acid; aa<sub>9</sub> is leucine; aa<sub>10</sub> is cystine; and aa<sub>11</sub> is leucine, and retromers, truncations, extensions, combinations, fusions, and derivatives thereof, said peptide having antimicrobial activity.

62. The antimicrobial peptide composition of Claim 61, wherein said amino acid core sequence further contains the amino acid sequence aa<sub>12</sub>-aa<sub>13</sub>-aa<sub>14</sub>-aa<sub>15</sub>-aa<sub>16</sub>-

aa<sub>17</sub>, and wherein aa<sub>12</sub> is selected from the group consisting of aspartic acid, glutamic acid, lysine, and glycine; aa<sub>13</sub> is leucine; aa<sub>14</sub> is glutamine; aa<sub>15</sub> and aa<sub>16</sub> are alanine; and aa<sub>17</sub> is leucine.

63. The antimicrobial peptide composition of Claim 62, wherein said amino acid core sequence further contains the amino acid sequence aa<sub>18</sub>-aa<sub>19</sub>-aa<sub>20</sub>, and wherein aa<sub>18</sub> is selected from the group consisting of tyrosine, phenylalanine and tryptophan; and aa<sub>19</sub> and aa<sub>20</sub> are selected from the group consisting of lysine, arginine, and glutamic acid.

64. The antimicrobial peptide composition of Claim 63, wherein said amino acid core sequence further contains the amino acid aa<sub>21</sub> selected from the group consisting of lysine, arginine, and glutamic acid.

65. An antimicrobial peptide composition for use against organisms such as bacteria and fungi, comprising:

a peptide consisting of PMP-1 (Sequence No. 2), and truncations, retromers, extensions, combinations and fusions thereof, and D-isomeric amino acid, retromeric, N-monomethyl-lysine, and fluorinated amino acid derivatives thereof, said peptide having antimicrobial activity.

66. An antimicrobial peptide composition for use against organisms such as bacteria and fungi, comprising:

a peptide consisting of PMP-2 (Sequence No. 1), and truncations, retromers, extensions, combinations and fusions thereof, and D-isomeric amino acid, retromeric, N-monomethyl-lysine, and fluorinated amino acid derivatives thereof, said peptide having antimicrobial activity.